SDMS DocID 2210928

ORIGINAL

Morton Thiokol/Triumph Explosives Site Summary

Prepared by D. Fulsher-Thatcher, EPA FUDS Program VISTA
Maps prepared by Tech Law; modified by Michael Eller, EPA Intern

Site History:

* This site has a complex site history with multiple occupations & ownership. Portions of the site were formerly operated by DOD or owned by private industries.

* The site can be subdivided into several parcels: the Dwyer Property, the Vicon Property, & the National Fireworks property.

Dwyer Property: 71 acres between MD Routes 279 & Blue Ball Road

Triumph Fireworks/Explosives-

1933-1938: During this period the site was privately owned by Triumph Fireworks & fusee company. This company produced fusees, "floatlights", sparklers, & toy rockets.

1938-1946:

* The plant expanded from 5 acres to 611 acres during WW II to accommodate the demand of ordnance contracts with the Navy and the Army. The name of the plant was changed to Triumph Explosives Inc. to reflect the shift to explosives, munitions, & pyrotechnics production.

* A research lab & TNT melt pour system were added during the war related expansion of the plant.

* In 1942 an executive order was issued turning control of the plant over to the DOD. During this period the Navy controlled the portion on the western side of the site & the Army controlled the portion of the eastern portion of the site.

* Triumph explosives produced 40 mm ammunition, 20 mm ammunition, 81 mm ammunition, high explosive incendiary devices, flares, smoke grenades, lead azide , sodium azide, pentolite, TNT pellets, & penthrite. Shells were cleaned with solvents before packaging.

* TNT pellets and solvents were destroyed in a burn pit on the northwest portion of the site at Zeitler Farm. MDE is currently conducting a geophysical survey at this portion of the site.

* A plant explosion took place in 1943 which killed 15 people.

* The plant closed quickly at the signing of armistice at the end of WW II. ordnance was most likely disposed of onsite as was the practice during this period.

1946-1948:Bowers Battery- Assembly lines at the site manufactured radios. The company also produced and sold spark plugs & batteries.

1952-1955: Geigy Chemical Company- Owned a portion of the site and operated a dump on the southeast portion of the property near Little Elk Creek (Currently on MTI property). Geigy manufactured agricultural chemicals.

1955-1958- Olin Mathieson Chemical Corporation- purchased the parcel previously owned by Geigy Chemical, currently owned by MTI. Olin Mathieson manufactured agricultural chemicals.

1948-1958: Aerial Products-
* Aerial manufactured military pyrotechnics & loaded ammunition. The plant was located on the portion of the property which was formerly used by Triumph Explosives.

* During their occupation of the site Aerial produced 20 mm shells for the Navy ,distress signals & flares for the armed forces, & fuses & primers for 40 mm shells.

* The production facilities had conductive flooring which typically contains hazardous substances such as asbestos, barium, copper, & other metals.

* A former employee who had worked at the facility reported that carbon tetrachloride, solvents, metal degreasers, & metal cleaners were frequently used at the plant. The solvents were stored in drums. There is little information available on disposal practices at the site other than a news article mentioning that trash from the plant was burned in a firehole with an unspecified location.

1958-1972: Martin Dwyer- Mr. Dwyer, was a local Dairy Farmer, who reportedly used the site for grazing cattle.

1972-1983: General Tire & Rubber Company-
* General Tire manufactured tires.

1983- : W.L. Gore -
* Used a portion of the site for a warehouse for clothing fabric inspection & storage.

Vicon Property 900-1100 blocks of Singerly Road

1920-1932: Victory Sparkler & Specialty Company-
* Victory manufactured sparklers, fireworks, novelties, & pyrotechnics.

1932-1946: National Fireworks/Victory Fireworks & Specialty Co.-

* The company manufactured 20 mm ordnance under contract to the Navy& manufactured fireworks & pyrotechnics.

1946-1953: Penn Materials-
* Penn Materials acquired the site for the purpose of selling & distribution of building materials & plumbing supplies.

1953-1981: Sheppard Company
* This company was involved in building and demolitions work and real estate. The MDE PA report claims that this Sheppard manufactured military chemical ordnance & pyrotechnics during the Korean Conflict & fireworks during peacetime. The report does not provide any evidence to support this claim.

1981-1988: Vicon Corporation-
* the purpose of this corporation was to manage and supervise real estate and operate commercial business ventures.

National Fireworks Property 900-1100 blocks of Singerly Road adjacent to the Vicon Property

1932-1946: National Fireworks/Victory Fireworks & Specialty Co.-
* The company was said to manufacture fireworks, pyrotechnics, products for munitions, foundry products, oil burners, & toys.

1950-1955: American Powder purchased the Army side of Triumph explosives. This company manufactured pyrotechnics for the Army.

1958-2001: Morton Thiokol Inc.-

* Located on former Navy side of Triumph Explosives plots 169,446, & 482

* MTI manufactured rocket propellant containing ammonium perchlorate

2001-: ATK-
* Purchased MTI property in 2001

1972- Crouse Brothers Excavating- 11 acres located at 415 West Pulaski Highway east of MTI/ATK site

* The property was used as an equipment yard and as a landfill for clean fill & construction debris. Crouse brothers utilized several USTs for storage of fuel and cleaning of equipment.

Confirmed & Potential Sources:
* Pesticide dump (rusted cans, pails, & rusted out drums in "G" Area Previously owned by Geigy Chemical Company (See Tech Law Maps)
* Triumph Explosives TNT & solvent burn pit (Zeitler Farm)
* Conductive flooring from Aerial Products
* Asbestos storage area (MTI)
* MTI solvent burn pits (3)used for burning waste propellant
*Abandoned berylium pit (MTI property)
* Surface Impoundment (MTI) used for disposal of waste propellant
* Solvent Recovery still bottom area
* Abandoned sand pit used for solvent disposal (MTI)
* Disposal Trenches (2) used for disposing empty rocket motor cases & berylium contaminated tools(MTI)
* TCE plume
* TCA plume
*Perchlorate plume
* Discarded Paint cans
* Corroded 55 gallon drums
* Landfill located on the Gore site with abandoned, rusted, 55 gallon drums

Contaminants of Concern:
Asbestos
Carbon Tetrachloride
Trichlorethylene
Methylene Chloride
Tolulene

Vinyl Chloride
Perchlorates
Trichloroethane
Barium
Beryilium
Cadmium
Chlorobenzene
Chromium
Copper
Lead
Zinc
pesticides
TNT
DNT
PETN
Smokeless Powder (An explosive hazard rather than a toxicological one)
benzene
DCA
styrene
PCE
toluene
trans-DCE
MIBK
xylenes
1,1,2,2-tetrachloroethane
Nickel
Lindane
nitrobenzene
manganese

Environmental Studies Conducted

G.L. Gore Site (Triumph Industrial Park)- Located on former Navy side of Triumph Explosives

MDE-303 PA/SI 1988

* Samples were taken from a small spring on the G.L. Gore property during a routine inspection of Triumph Industrial Park Conducted in 1983. Contaminants such as benzene, tolulene, xylene, trans-DCE, TCA, TCE, PCE, vinyl chloride, chlorobenzene, methylene chloride, phenols, phthalates, ethylbenzene, & isophorone were found. These contaminants had also been detected in Galaxy Chemical lagoons in 1968. TCE, DCE, TCA, trans-DCE, benzene , styrene, xylenes, & vinyl chloride levels in the samples were

found to exceed EPA drinking water standards.

* MDE gathered additional samples from this site in 1988 and detected high levels of VOC's and metals such as arsenic, barium, cadmium, chromium, copper, lead, nickel & zinc.

* An industrial landfill became active on this property beginning in 1952 according to aerial photographs from this period. This landfill was located on the north bank of Little Elk Creek, near an old power plant which generated steam for the entire industrial park.

* 1970 aerial photographs show the landfill on the Gore site. The landfill was inspected and found to be covered in vegetation. Rusted 55 gallon drums were visible on the surface of the landfill.

HRS Score (1989) = 45.5

Sampling Summary from MDE-303 PA/SI 1991 from G.L. Gore Site/Triumph Industrial Park:

Trench 1- GW samples
benzene- 5,820 ppb
DCA- 44 ppb
styrene- 10ppb
PCE- 42 ppb
TCE- 84 ppb
toluene- 12,580 ppb
TCA- 323 ppb
vinyl chloride- 563 ppb
trans-DCE- 1,394 ppb
MIBK- 1,915 ppb
total xylenes-675 ppb
1,1,2,2-tetrachloroethane- 415 ppb

Trench 2- GW samples
benzene- 182 ppb
styrene- 51 ppb
PCE- 579 ppb
TCE- 448 ppb
toluene- 26,861 ppb
vinyl chloride- 30 ppb
trans-DCE- 423 ppb

total xylenes- 10,089 ppb
1,1,2,2-tetrachloroethane- 7,660 ppb

Spring Water Samples-
benzene- 2,400 ppb
PCE- 12,000 ppb
TCE- 14,000 ppb
toluene- 190,000 ppb
TCA- 410 ppb
vinyl chloride- 70 ppb
trans-DCE- 11,000 ppb
total xylenes- 4,300 ppb
1,1,2,2-tetrachloroethane- 15,000 ppb
chlorobenzene- 5,000 ppb

Surface Water Samples-
TCE- 3 ppb
TCA- 3 ppb
carbon tetrachloride- 1 ppb

Soil Samples-
benzene- 195 ppm
PCE- 19,150 ppm
TCE- 5,113 ppm
toluene- 1,125 ppm
trans-DCE- 385 ppm
MIBK- 2.5 ppm
1,1,2,2-tetrachloroethane- 2,695 ppm
chorobenzene- 2,705 ppm
arsenic- 102.9 ppm
copper- 4.015 ppm
lead- 753 ppm

* A Screening Site Inspection Report was prepared by MDOE for EPA in 1989. Site inspection teams found numerous demolished buildings, paint cans, 55 gallon drums, & a pile of flare casings. A hand dug cistern located on the property was sampled and found to be contaminated with TCE (43 ppb), PCE (4 ppb), & trans-DCE (31 ppb). The sampling results for TCE are above the MCL for TCE (0.005 mg/L).

Vicon Property-
* A PA was conducted by MDOE for EPA in 1990. According to the Preliminary Assessment , an explosives investigation conducted before the manufacturing facility was demolished confirmed that explosives, chemical munitions, incendiaries, & pyrotechnics had been manufactured on the property.

National Fireworks Property-
* A PA dated 1/1991 for this property stated that concrete block structures presumed to be used for ordnance assembly & storage remained onsite.

* Two large earthen berm containment structures were found on the property. FWA Environmental Science, Inc. interpreted an open area in an aerial photograph of the property to be an open burn area.

* FWA Environmental Science, Inc. conducted sampling during an environmental risk assessment of the property. The soil is impacted with RDX, 1,3-dinitirobenzene, HMX, 1,3,5-trinitrobenzene, & tetryl. The following metals were detected above background levels:

arsenic- 8.8 ppm
chromium- 90 ppm
lead- 258 ppm
zinc- 973 ppm
cadmium- 7.7 ppm
nickel- 38 ppm

Morton Thiokol Inc./ATK Site- Located on former Navy side of Triumph Explosives, plots 169,446, & 482

MD-100 PA/SI 1984 Report Summary:

*Pesticide dump found onsite with numerous empty bottles, corroded 55 gallon drums, a mounds of white material found to contain DDT, DDE, & DDE.

* Asbestos storage area located onsite.

* Stained soil found in C-Area propellant burn field.

* Badly decomposed drums were found in A-area burn field.

* Samples were not collected in sand pit area. Two thousand gallons of photographic waste water & boiler blow down were disposed of there per year. It was abandoned in 1980.

* Correspondence from MDE dated 1/22/1986 to EPA indicates potential burial of waste explosives onsite and recommends further investigations. Nitrobenzene was detected in MW # 2 at 35 ug/L. * Explosive compounds were also found in soil at the site.

* Workers were observed storing 20 lb. bags of powdered lead in the area of water well G-6.

* TCE was detected in well A-4 at 4,010 ppb which exceeds the current MCL of 5 ppb for TCE. DCE was detected at 11 ppb from this well. TCE was detected in a sample from well G-1 at 6300 ppb.

* Low levels of pesticides were detected in ground water samples such as Endrin, Lindane, Toxaphene, Methoxychlor, 2,4-D, & 2,4,5-TP. Aldrin was found in a clay sample at 34 mg/kg (ppm). DDT was detected in clay samples at 1000 mg/kg. Dieldrin was found in clay samples at 105 mg/kg.

<u>Crouse Brothers Excavating-</u> 11 acres Located at 415 West Pulaski Highway east of MTI/ATK site

MD-314 1990 PA/SI Report Summary:
* The Crouse Brothers landfill came to the attention of MDE in 1986 during its investigation of MTI. This investigation involved a search for potential sources of a TCE plume along route 40, which was located down gradient from the Crouse Brothers Site.

* Results from the 1988 G & M monitoring study indicated that domestic wells located down gradient from the landfill had the highest TCE concentrations. Additionally, monitoring wells placed at the toe of the landfill also had the highest concentrations of TCE.

* SI report suggested that site may have been used by the military for storage of munitions prior to Crouse Brother's ownership.

* TCE concentrations found in groundwater samples from the site in 1990 ranged from less than 5 ppb to 4400 ppb. TCA contamination was detected in groundwater ranging from 320 ppb to 1500 ppb. DCA was also detected in wells at concentrations ranging from 5 ppb to 15 ppb. Carbon tetrachloride was detected at levels ranging from 5 ppb to 14 ppb. PCE

concentrations in groundwater ranged from 7 ppb to 15 ppb. Lindane was detected in groundwater at 4 ppb. Nickel was also detected at 100 ppb.

HRS Score (1990) = 29.5

Dwyer Property (Formerly occupied by Triumph Explosives)- 72 acres
ESI for Dwyer property(MD-313) 2001

* Wastes onsite included 2,400 sq. foot mound of flare canisters, 1,250 foor pile of partially buried tin cans, 100 x 50 foot area with 55 gallon drums and construction and household wastes.

* Inorganic contaminants detected in the groundwater included: antimony, arsenic, beryllium, chromium, thallium, lead, and nickel. The levels of theses contaminants exceeded their respective MCL's.

* Perchlorates and explosives were not detected in groundwater.

* VOCs such as TCE and carbon tetrachloride were detected at levels exceeding MCLs. The ESI report recommended that further study be conducted to characterize aqueous phase VOCs that may originate from a potential DNAPL pool.

* Surface water samples and sediment samples collected from Dogwood Run were consistent with earlier sampling events which documented VOC contamination. VOC contamination was believed to result from groundwater discharge during base flow. Heptachlor was detected at levels in sediment exceeding Threshold Effects Level for fresh water sediments.

* Arsenic, iron, and Benzo(a)pyrene were detected in soils exceeding RBCs for residential soil. Perchlorates, PCBs, & explosives were not detected in soil samples.

HRS Pre-score (2001)= 27.32

Surface Water & Ground Water at Triumph Industrial Park Vol. I 1998

* An assessment of the surface water and sediments of Little Elk Creek and the groundwater of Triumph Industrial Park was performed under a cooperative agreement between MDE and EPA.

* Groundwater samples were impacted with chlorinated VOC's, PAHs, and inorganic contaminants exceeding their respective benchmarks.

* Lot 18 may be a potential source of solvent contamination due to the presence of stained soil and stressed vegetation on this parcel.

* Groundwater at Lots 11 & 12 may be impacted by the still bottoms disposal area of the GE Railcar site (TCE, benzene, and chlorobenzene).

* Lots 4, 6A, 7B, 10, 15, 16, 20, parcels 52 I, 52-II, and 52-IV did not exhibit any signs of groundwater contamination.

Low concentrations of TCE were detected in Dogwood Run. TCE contaminated groundwater originating from the Dwyer property is a possible source of contamination. Lindane was detected above RBCs in sediment samples.

* The report recommended that groundwater in the TIP vicinity should not be used for drinking water based on groundwater sampling results.

RCRA Update: POC Linda Holden RCRA #3428-
* RFS scheduled for ATK site (former Morton Thiokol site).

* 6 solid waste units: berylium pit, still bottom, Area G sand pit (cadmium), pesticide area, Area A burn area, TCE/Perchlorate plume in SE.

* Capping of the pesticide dump has been proposed. EPA has not approved the procedure due to concerns about ground water quality. Area needs a full round of GW sampling.

* Sampling has been conducted in Little Elk Creek. Sediment samples taken in the creek had elevated levels of VOC's & perchlorates presumably from groundwater discharge.

* Sediment samples were taken from the intermittent stream due to the concern that pesticide laden soil was eroding into the stream & offsite.

* Sampling was conducted of residential wells along Route 40 within a 1 mile radius of the site in 1999. Two residence's wells have elevated levels of TCE & 1,2-dichlorobenzene exceeding RBC's.

* Although many people were put on bottled water in the 1980's due to solvent contamination of the groundwater many did not abandon their wells and some dug new ones.

* Perchlorate levels at MTI/ATK site are 500 ppb in groundwater (RCRA data).

MDE FUDS Program Update:

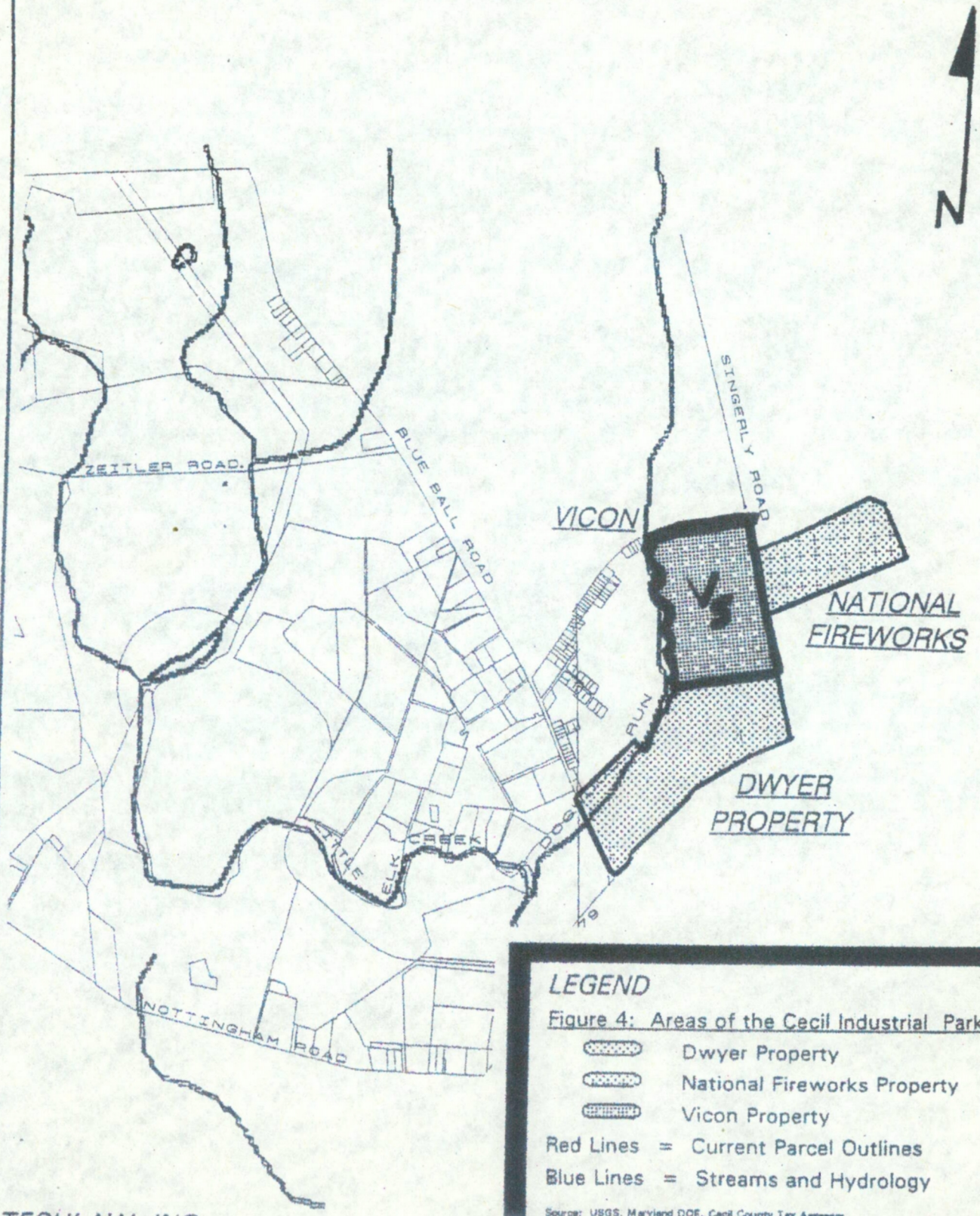
*A geophysical study (EMI 31) was performed in the Zeitler Farm Area in a attempt to locate a burn pit which was formerly used by Triumph Explosives for incinerating TNT pellets. The survey found the location of the burn pit along with several anomalies.

* Another burn pit was also located in the Zeitler farm area which was used by MTI for disposing of waste propellant contained in rockets. Rockets were fired on cement structures to remove propellant and recover rocket casings. A lease indicates that MTI leased this area. Ground water in the area may be impacted with perchlorates.

* A perchlorate plume has entered the groundwater underlying the GE Railcar site originating from the Zeitler farm area.

1921-1933

Vs = Victory Sparkler



LEGEND

Figure 4: Areas of the Cecil Industrial Park Site

- Dwyer Property
- National Fireworks Property
- Vicon Property

Red Lines = Current Parcel Outlines

Blue Lines = Streams and Hydrology

Source: USGS, Maryland DOE, Cecil County Tax Assessor

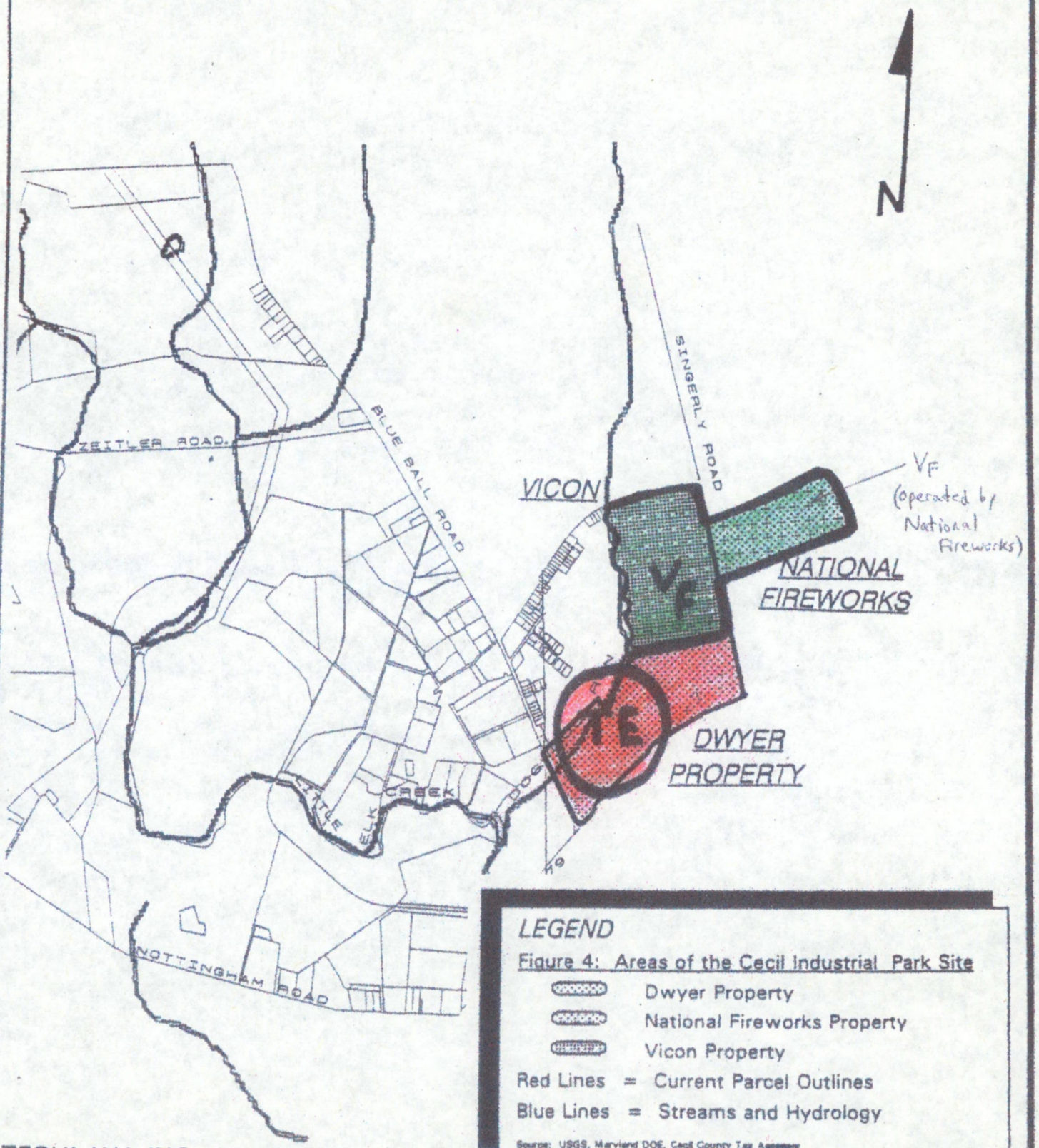
TECHLAW, INC.

ARMY CORPS OF ENGINEERS--PRIVILEGED AND CONFIDENTIAL

1933

VF = Victory Fireworks

TE = Triumph Fusee and Fireworks (Triumph Explosives)



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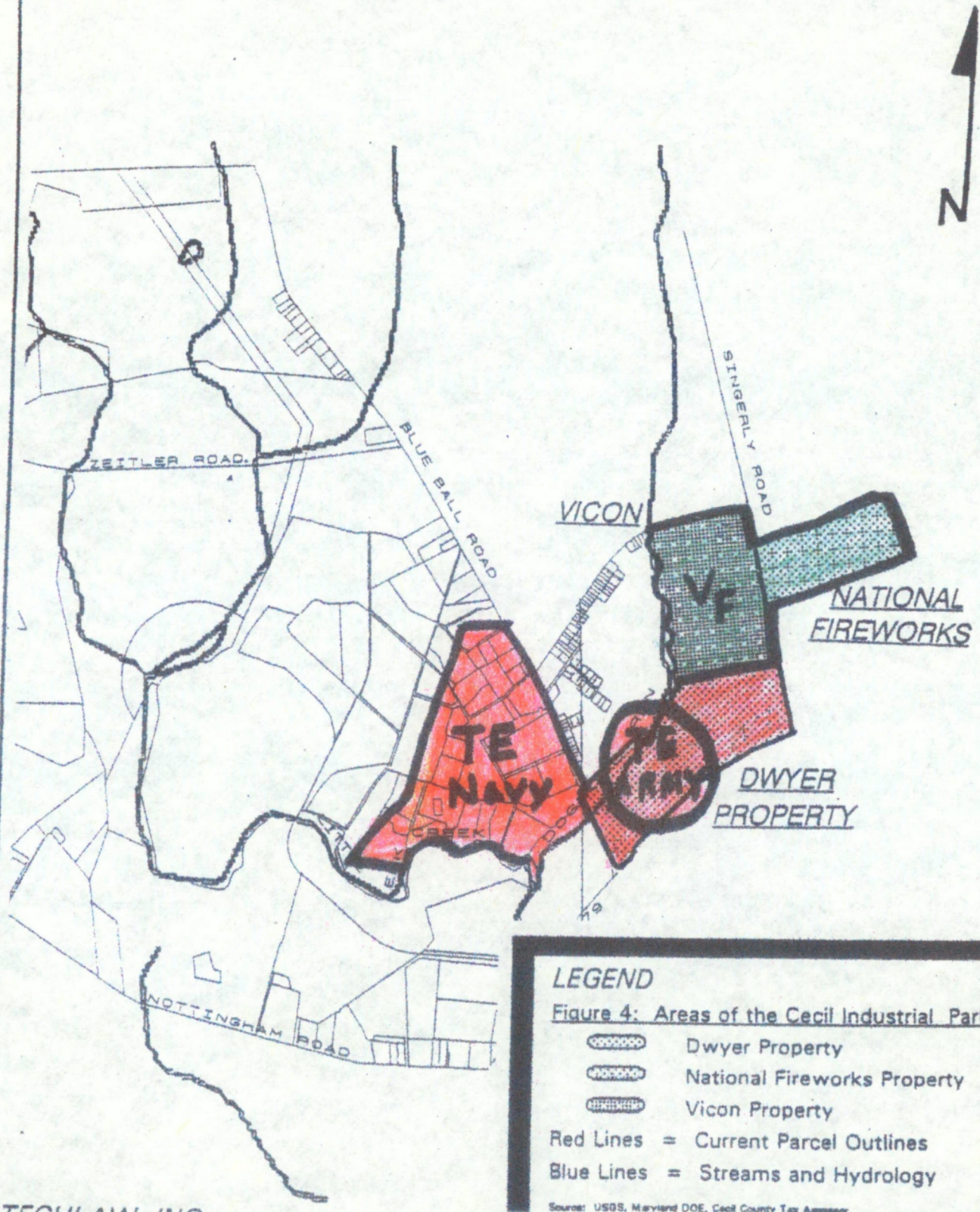
TECHLAW, INC.

ARMY CORPS OF ENGINEERS–PRIVILEGED AND CONFIDENTIAL

Feb., 1940

V_F = Victory Fireworks

TE = Triumph Explosives (Army and Navy sides)



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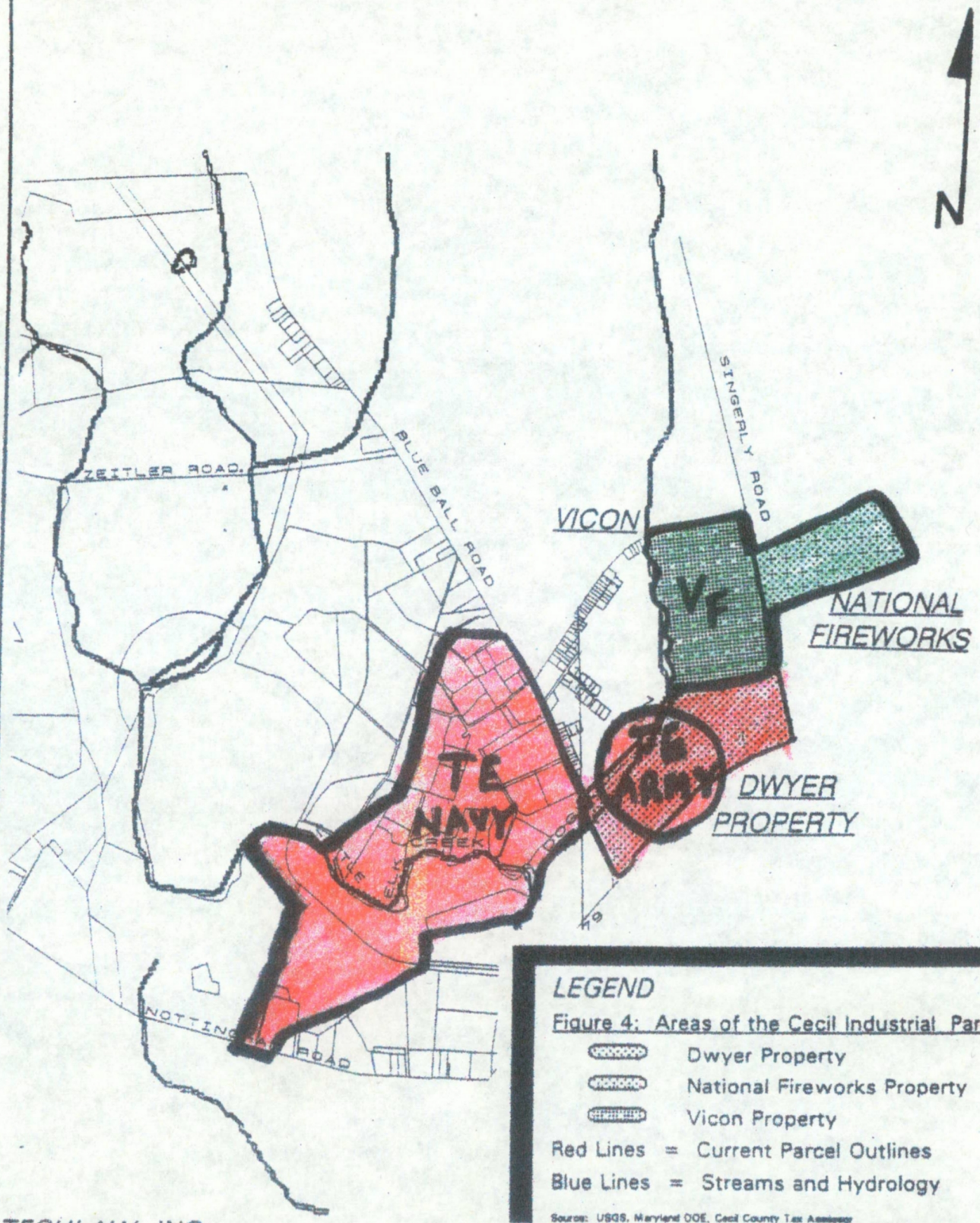
TECHLAW, INC.

ARMY CORPS OF ENGINEERS--PRIVILEGED AND CONFIDENTIAL

June, 1940

VF = Victory Fireworks
TE = Triumph Explosives (Army and Navy sides)



TECHLAW, INC.

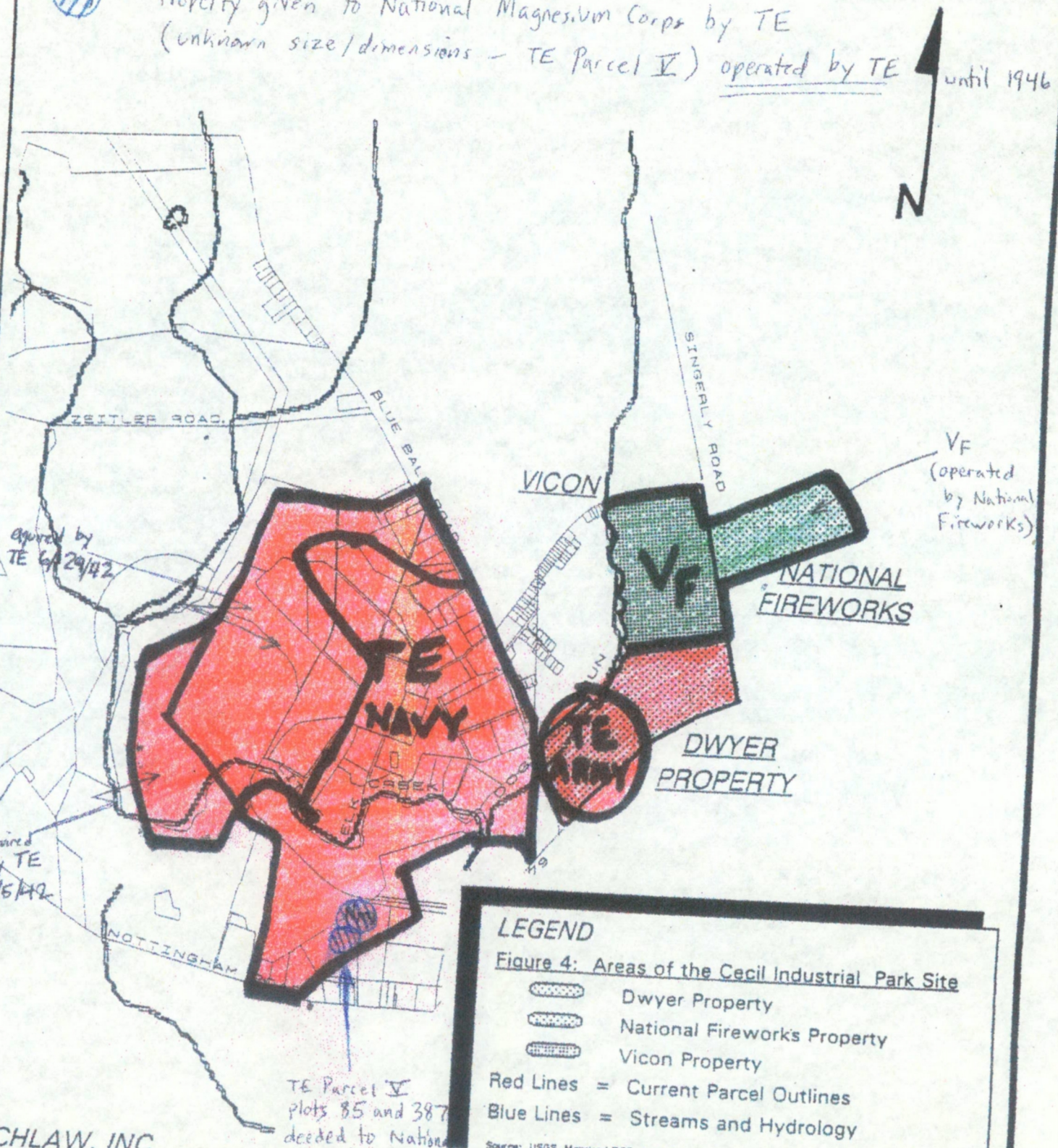
ARMY CORPS OF ENGINEERS–PRIVILEGED AND CONFIDENTIAL

June-Aug., 1942

V_F = Victory Fireworks

TE = Triumph Explosives (Army and Navy sides)

Navy - Property given to National Magnesium Corp. by TE (unknown size/dimensions – TE Parcel V) operated by TE until 1946



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TECHLAW, INC.

ARMY CORPS OF ENGINEERS

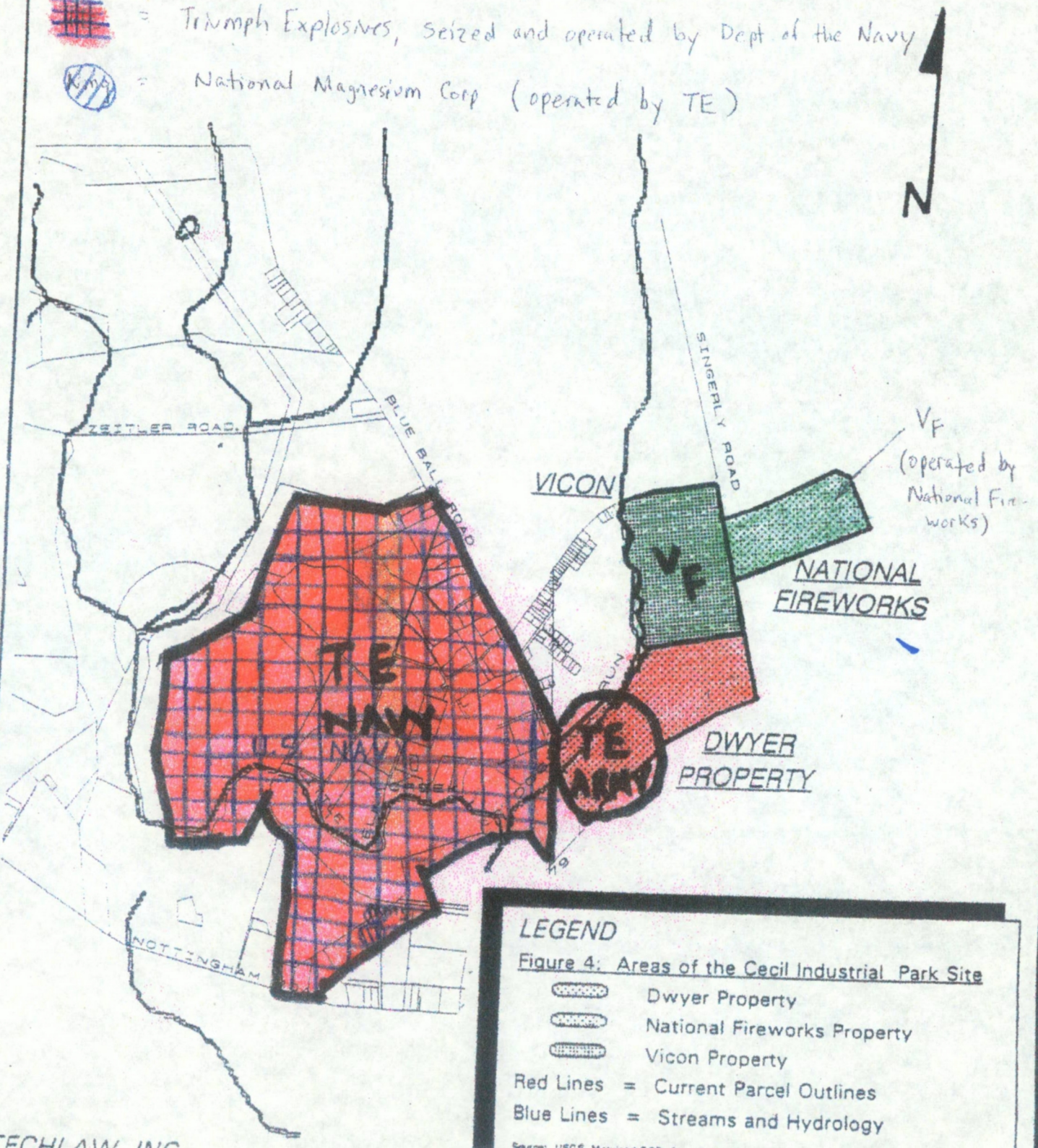
Oct, 1942 - Feb., 1943 U.S. Navy seizure

V_F = Victory Fireworks

TE = Triumph Explosives, Army side

= Triumph Explosives, seized and operated by Dept of the Navy

= National Magnesium Corp (operated by TE)



TECHLAW, INC.

ARMY CORPS OF ENGINEERS

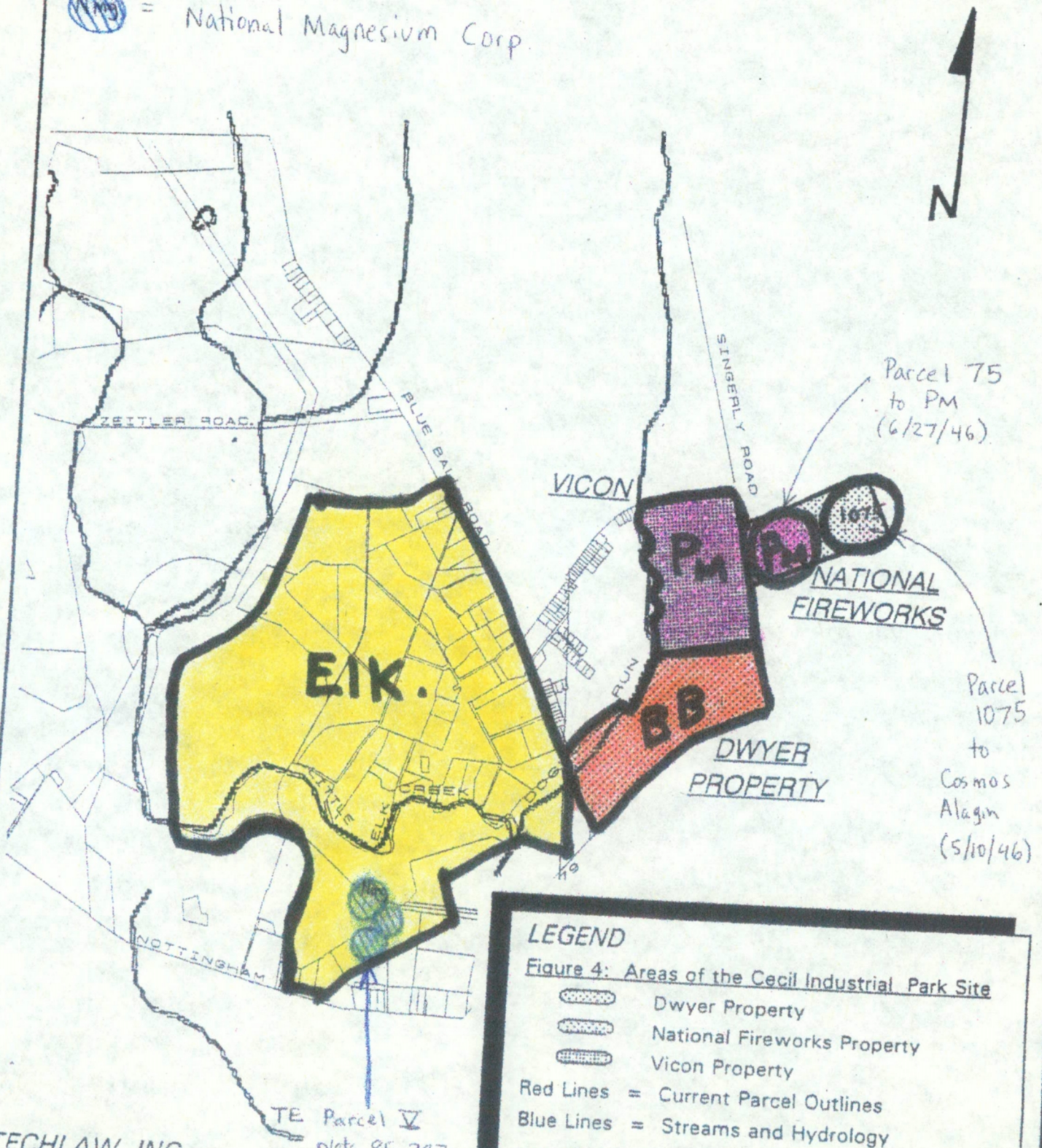
June, 1946

EIK = Elkton Co. (later Triumph Industrial Complex or Trinco Inc.)

BB = Bowers Battery and spark plug

PM = Penn Materials

NMC = National Magnesium Corp.



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TECHLAW, INC.

ARMY CORPS OF ENGINEERS

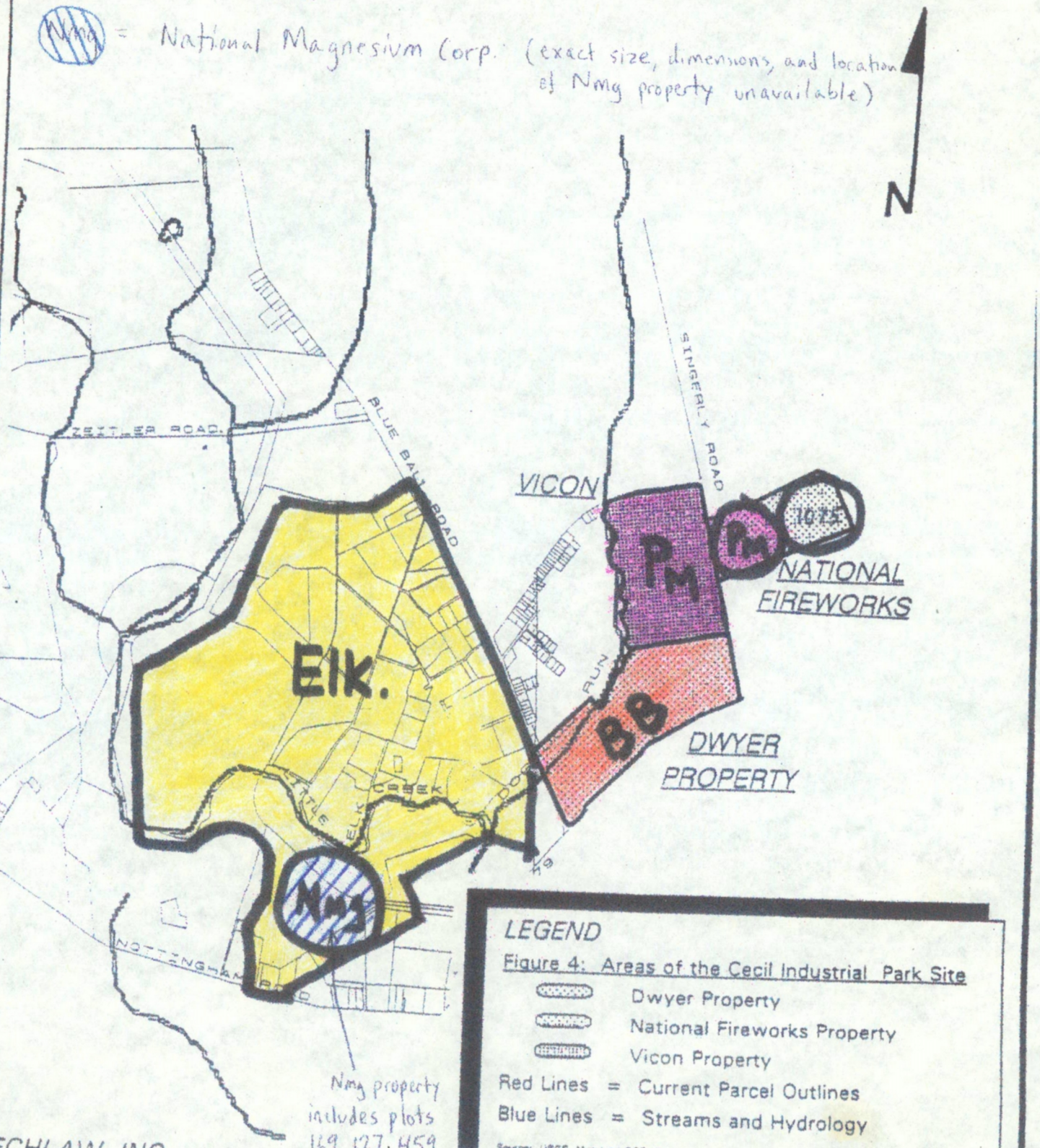
Sept., 1946

EIK = Elkton Co.

BB = Bowers Battery and spark plug

PM = Penn Materials

Nmg = National Magnesium Corp. (exact size, dimensions, and location of Nmg property unavailable)

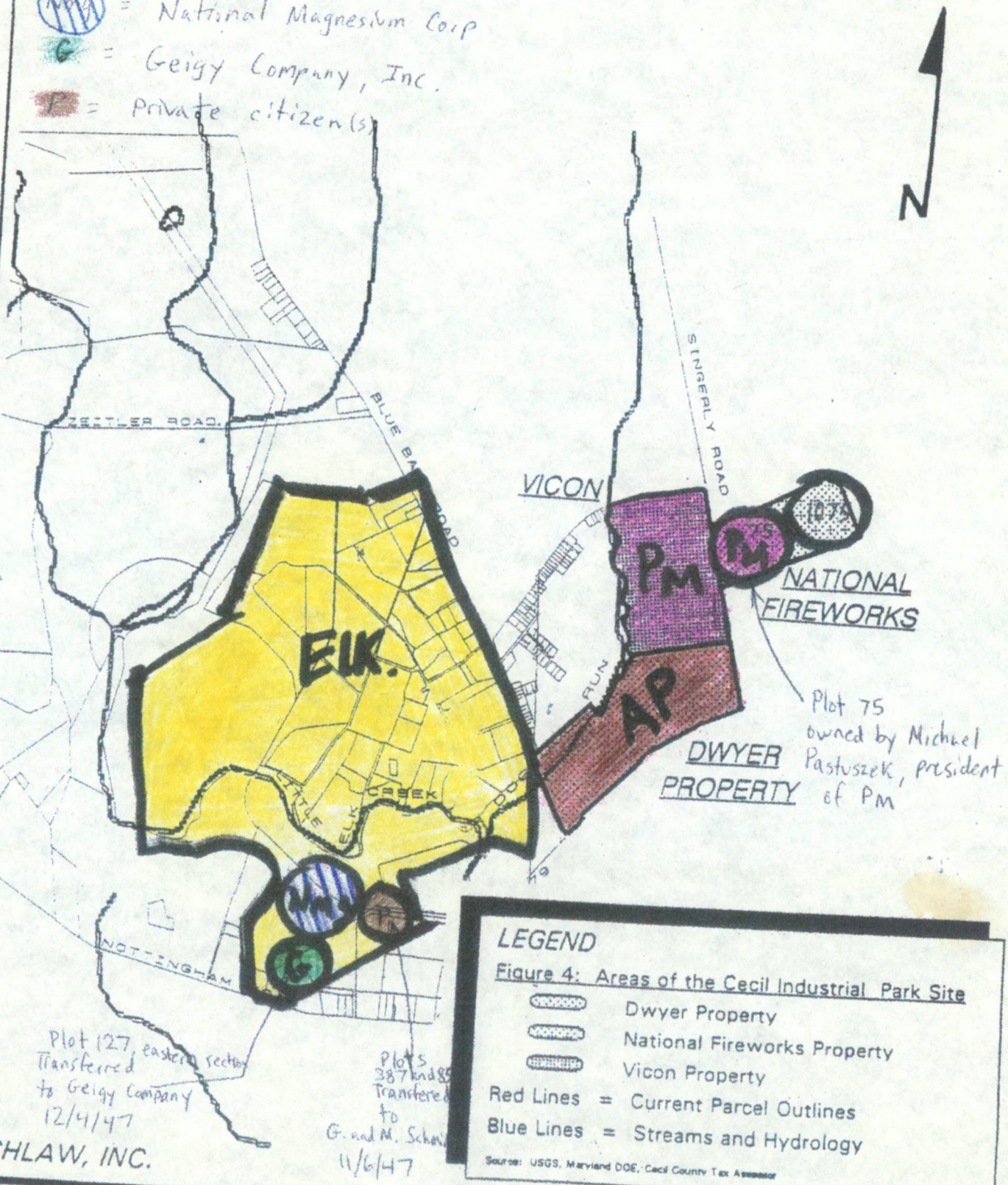


TECHLAW, INC.

ARMY CORPS OF ENGINEERS

1948

EIK. = Elkton Co.
AP = Aerial Products
PM = Penn Materials
NMC = National Magnesium Corp
G = Geigy Company, Inc.
P = Private citizen(s)



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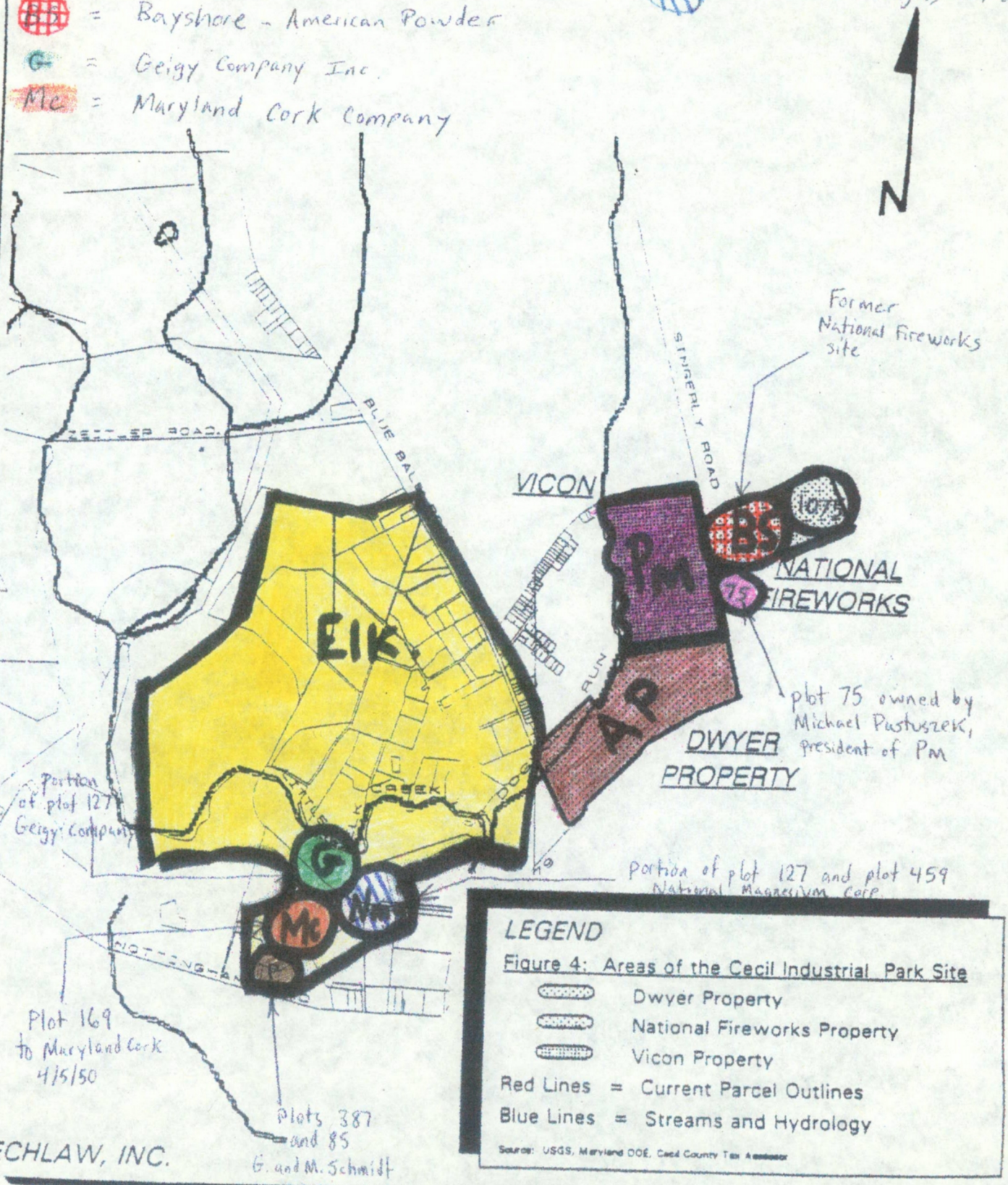
TECHLAW, INC.

ARMY CORPS OF ENGINEERS

1950

EIK = Elkton Co.
AP = Aerial Products
Pm = Penn Materials
BA = Bayshore - American Powder
G = Geigy Company Inc.
Mc = Maryland Cork Company
P = private citizen(s)
Mag = National Magnesium



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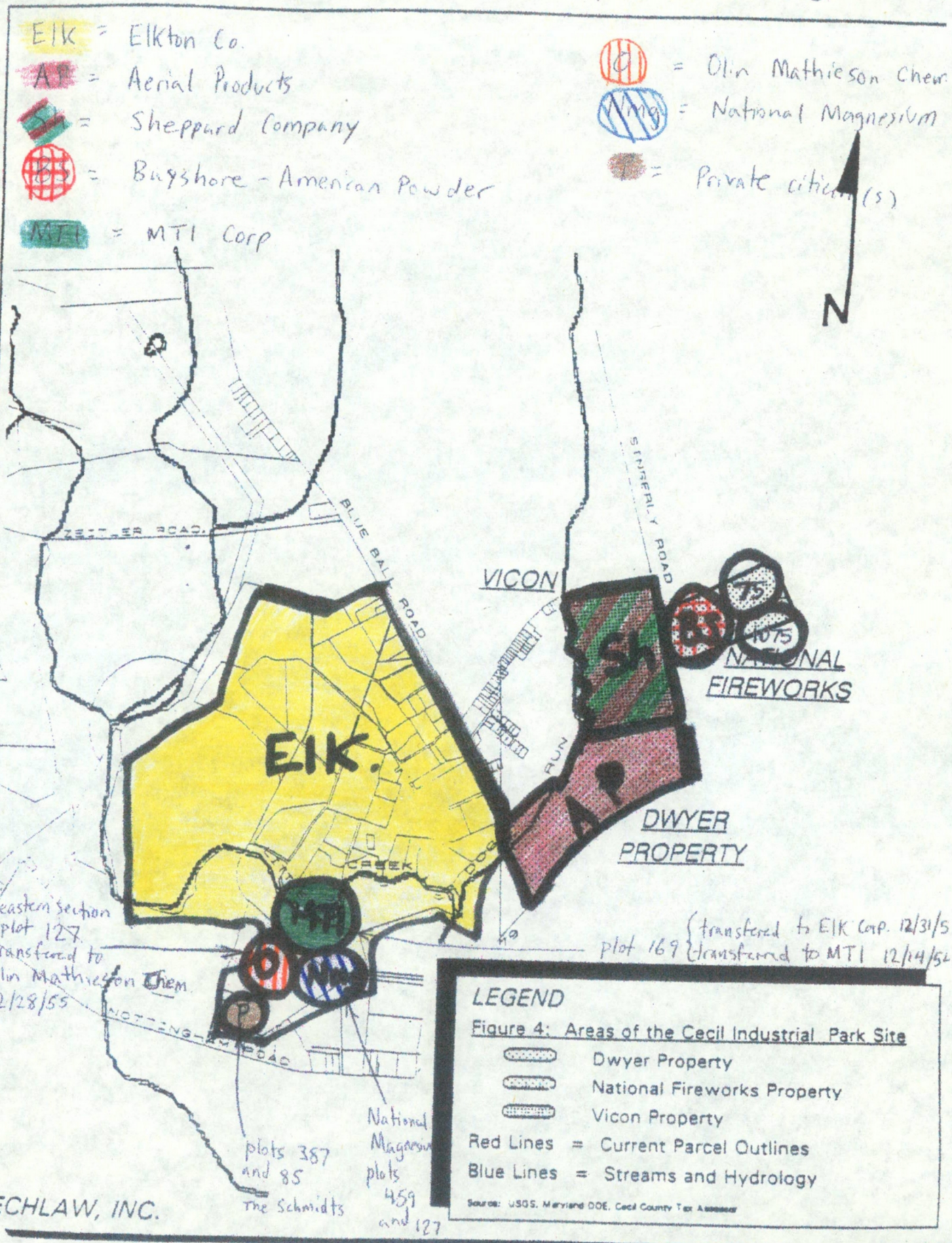
ARMY CORPS OF ENGINEERS

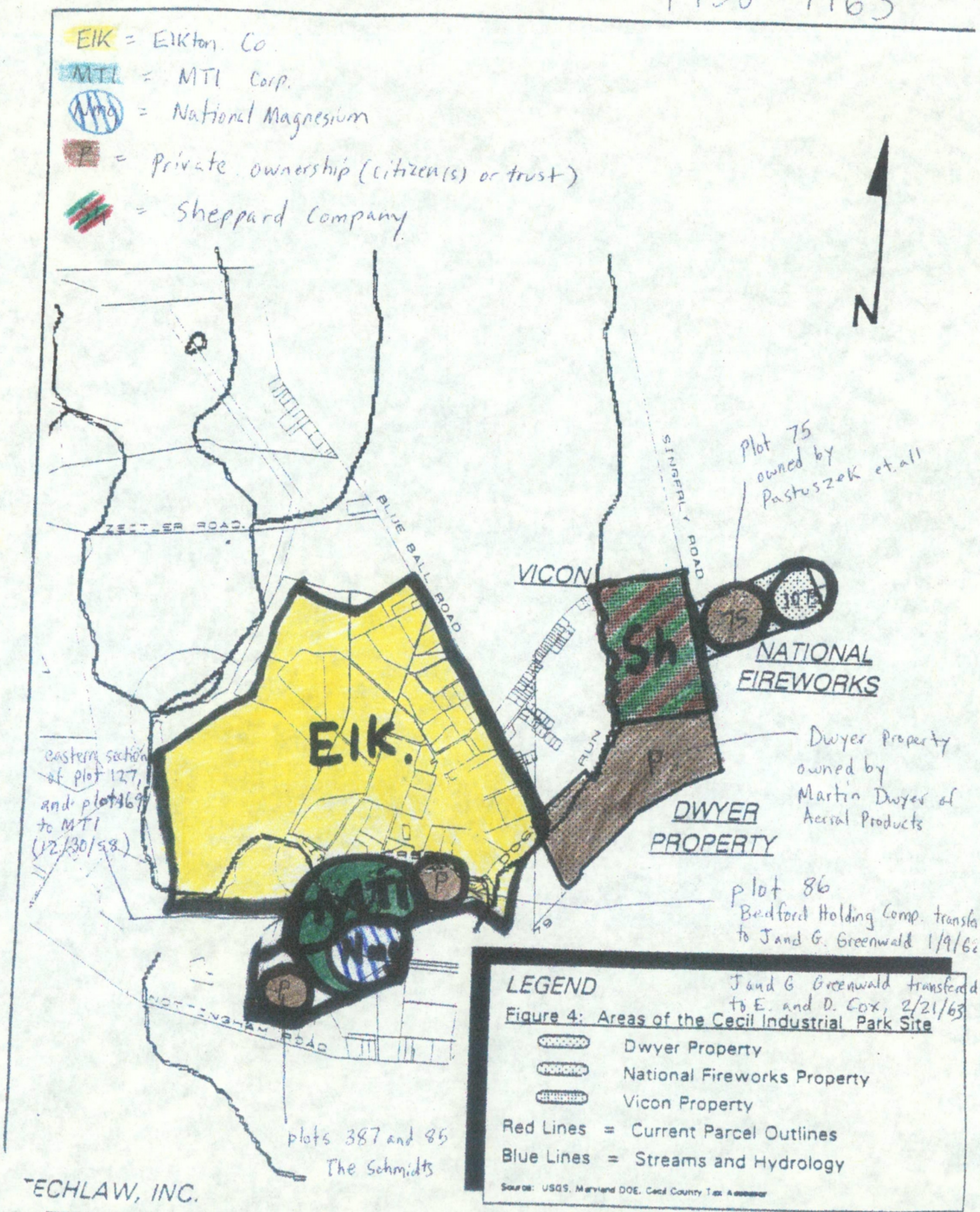
1951 - 1955



TECHLAW, INC.

ARMY CORPS OF ENGINEERS

1958 - 1963

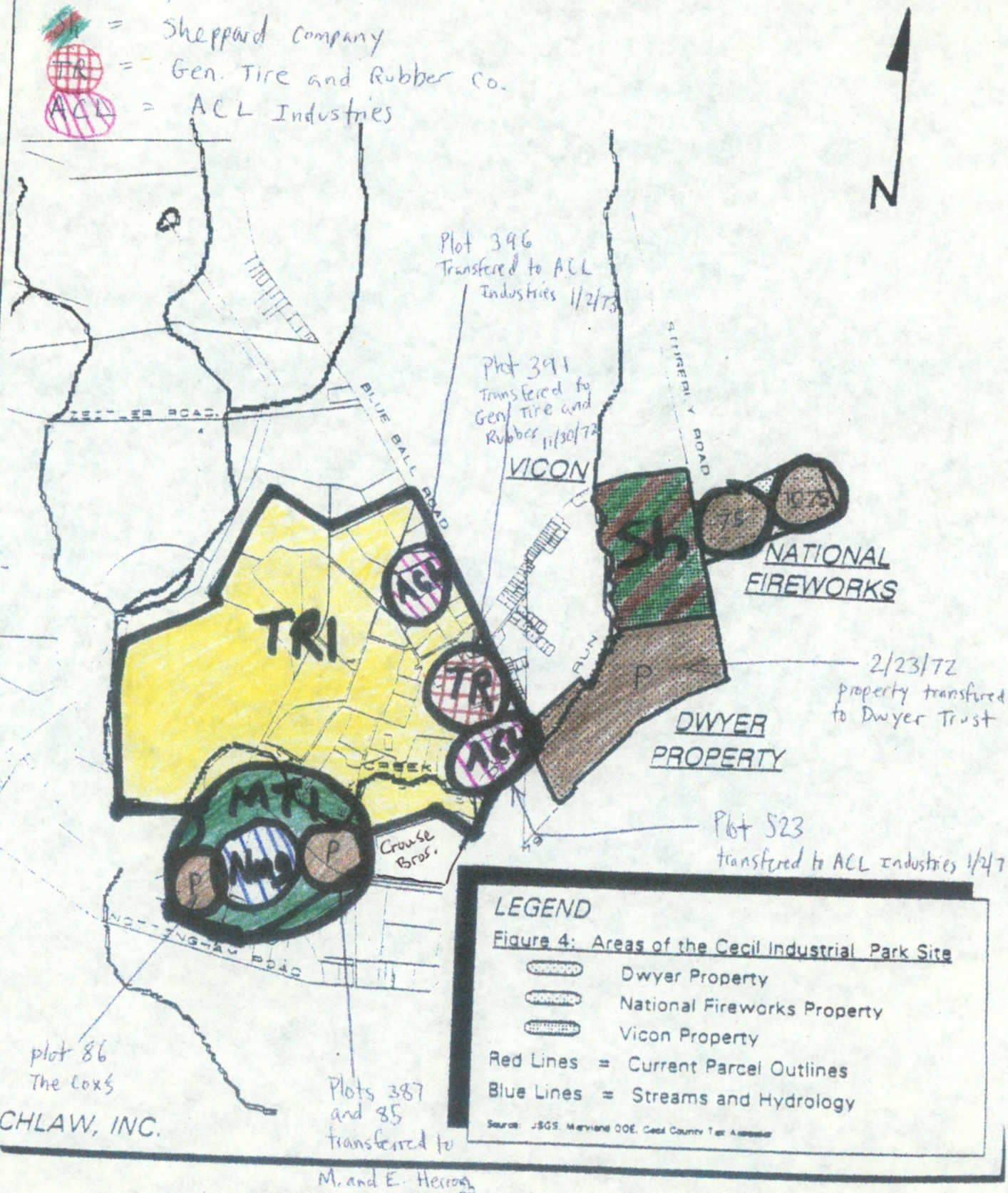


TECHLAW, INC.

ARMY CORPS OF ENGINEERS

1972-1973

TRI = Trinco Inc. (formerly Elkton Co.)
MTI = MTI Corp.
P = private citizen or trust
Sh = Sheppard Company
TR = Gen. Tire and Rubber Co.
ACL = ACL Industries
NMg = National Magnesium



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Source: USGS, Maryland DOE, Cecil County Tax Assessor

TECHLAW, INC.

ARMY CORPS OF ENGINEERS

1975 - Present

? = Last owner unknown (assumed transfered by Trinco to another owner)

MTI = MTI Corp.

P = private citizen or trust

S = Schultz Homes

D = Delaware Luggage Company

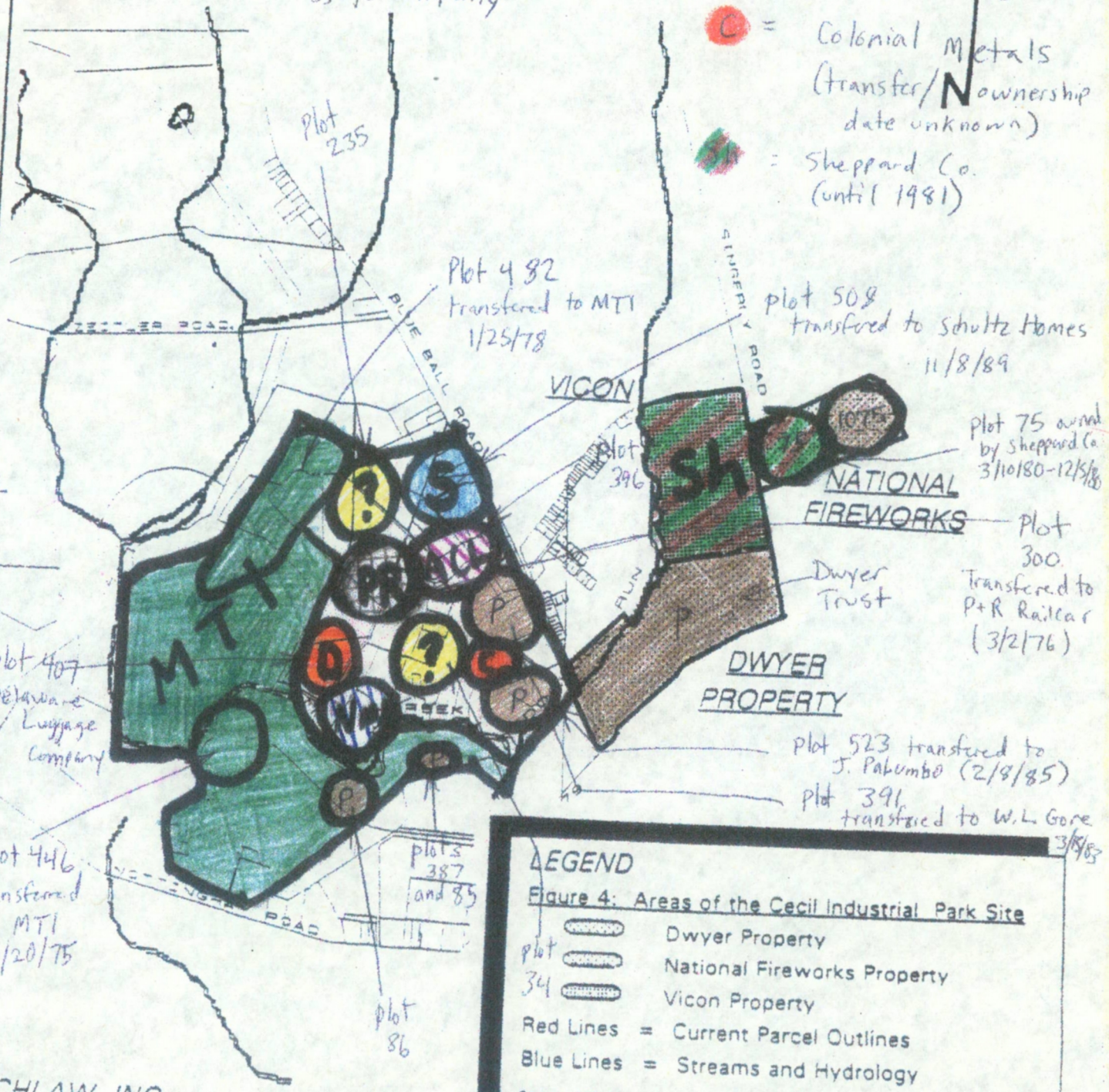
ACL = ACL Industries

P+R = P+R Railcar Corp.

NM = National Magnesium

C = Colonial Metals (transfer/ownership date unknown)

= Sheppard Co. (until 1981)



LEGEND

Figure 4: Areas of the Cecil Industrial Park Site

- Dwyer Property
- plot 34 — National Fireworks Property
- Vicon Property
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Source: USGS, Maryland DOE, Cecil County Tax Assessor

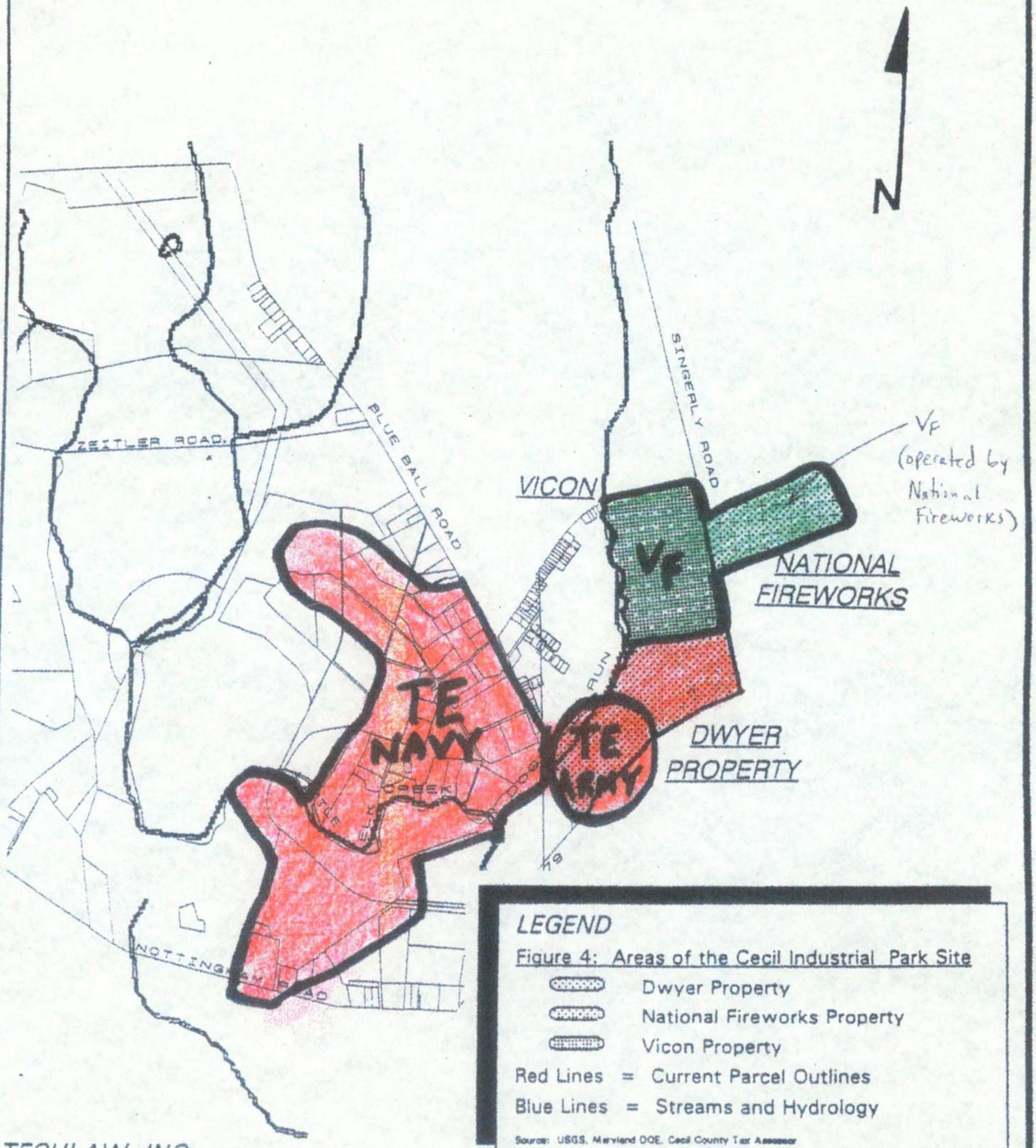
TECHLAW, INC.

ARMY CORPS OF ENGINEERS

July, 1941

VF = Victory Fireworks

TE = Triumph Explosives (Army and Navy sides)



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